BASIS FOR AMENDMENTS

Claim 3 has been amended as supported by Claims 5 and 13. New Claim 16 is supported by the specification, for example at page 15, last paragraph. New Claims 17-19 are supported by the specification and claims as originally filed, for example, Claims 3, 4 , 6 and 15.

No new matter is believed to have been added to the present application by the amendments submitted above.

Claims 1-19 are pending. Claims 1, 2 and 7-9 are withdrawn from consideration as being drawn to non-elected subject matter.

REMARKS/ARGUMENTS

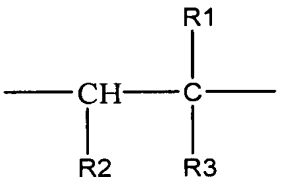
Favorable reconsideration is respectfully requested.

Claim 3 was amended to include the limitations of Claims 5 and 13. Claim 17 includes the limitations of Claims 3, 6 and 14.

The present invention as set forth in **Claim 3** relates to an **optical film exhibiting negative birefringence**, which comprises:

a resin composition, which comprises:

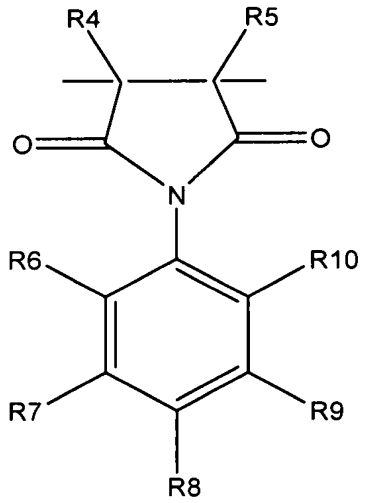
(a) 30-95% by weight of a copolymer comprising an α-olefin residual group unit represented by the following formula (i):



(i)

wherein R1, R2 and R3 each independently represent hydrogen or an alkyl group having 1-6 carbon atoms, and

an N-phenyl-substituted maleimide residual group unit represented by the following formula (ii):



(ii)

wherein R4 and R5 each independently represent hydrogen, or a linear or branched alkyl group having 1-8 carbon atoms; and **R6, R7, R8, R9 and R10 each represent hydrogen,** and having a weight average molecular weight, as reduced into standard polystyrene, of 5×10^3 to 5×10^6; and

(b) 70-5% by weight of at least one acrylonitrile-styrene based copolymer selected from an acrylonitrile-styrene copolymer and an acrylonitrile-butadiene-styrene copolymer, a weight ratio of an acrylonitrile residual group unit to a styrene residual group unit being 20/80 to 35/65, and having a weight average molecular weight, as reduced into standard polystyrene, of 5×10^3 to 5×10^6;

the optical film being obtained by uniaxially stretching the resin composition,

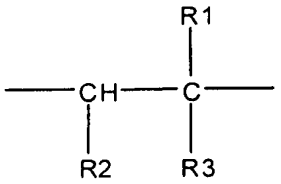
the optical film having a relationship of three-dimensional refractive indexes of nz≥ny>nx or ny≥nz>nx in the case where the stretching direction within a film plane is defined as an x-axis, a direction within a film place are perpendicular to the x-axis is defined as a y-axis, a direction outside the film, plane and perpendicular to the stretching direction is defined as a z-axis, a refractive index in the x-axis direction is

defined as nx, a refractive index in the y-axis direction is defined as ny, and a refractive index in the z-axis direction is defined as nz.

New Claim 17 relates to an **optical film exhibiting negative birefringence**, which comprises:

a resin composition, which comprises:

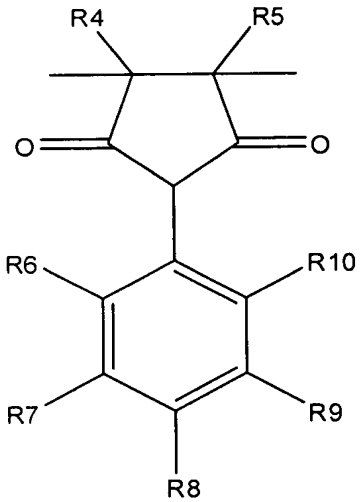
(a) 30-95% by weight of a copolymer comprising an a-olefin residual group unit represented by the following formula (i):



(i)

wherein R1, R2 and R3 each independently represent hydrogen or an alkyl group having 1-6 carbon atoms, and

an N-phenyl-substituted maleimide residual group unit represented by the following formula (ii):



(ii)

wherein R4 and R5 each independently represent hydrogen, or a linear or branched alkyl group having 1-8 carbon atoms; and **R6, R7, R8, R9 and R10 each represent hydrogen**, and

having a weight average molecular weight, as reduced into standard polystyrene, of 5×10^3 to 5×10^6; and

(b) 70-5% by weight of at least one acrylonitrile-styrene based copolymer selected from an acrylonitrile-styrene copolymer and an acrylonitrile-butadiene-styrene copolymer, a weight ratio of an acrylonitrile residual group unit to a styrene residual group unit being 20/80 to 35/65, and having a weight average molecular weight, as reduced into standard polystyrene, of 5×10^3 to 5×10^6,

the optical film being obtained by biaxially stretching the resin composition,

the optical film having a relationship of three-dimensional refractive indexes of nz>ny≥nx or nz>nx≥ny in the case where the stretching direction is define as an x-axis and a y-axis within a film plane, a direction outside the film place and perpendicular to the x-axis and y-axis is defined as a z-axis, a refractive index in the x axis direction is defined as nx, a refractive index in the y-axis direction is defined as ny, and a refractive index in the z-axis direction is defined as nz.

The claimed invention relates to an optical film, particularly suited for a retardation film, comprising (a) 30 to 95% by weight of a copolymer containing an α-olefin residual group unit represented by the formula (1) and an N-phenylmaleimide residual group unit represented by the formula (ii) and (b) 70 to 5% by weight of an acrylonitrile-styrene polymer, and satisfying the relation of three-dimensional refractive indexes of nz≥ny>nx or ny≥nz>nx (Claims 3, 4, 15, 16), or nz>ny≥nx or nz>nx≥ny (Claims 17-19).

The negative birefringence and the specified relation among the three-dimensional refractive indexes, both characterizing the optical film according to the present invention, are two-dimensional functions developed by the orientation of the polymer chains constituting the film, not the functions that the material inherently has.

The double patenting rejection of Claims 3-6 and 10-15 over claims 1-4 of US 7,001,967, in view of paragraphs [004 and 005] of the specification, and in further view of Arakawa et al is traversed.

The claims of US 7,001,967 fail to disclose or suggest the use of **a combination of components a) and b) in the amounts as claimed** or that such **combination gives an optical film having negative birefringence or the claimed relation among the three-dimensional refractive indexes.**

Arakawa et al disclose only the use of styrene/acrylonitrile copolymer and fail to disclose the use of component a). Arakawa et al disclose that a uniaxially stretched film of a styrene-acrylonitrile copolymer exhibits negative birefringence. It also discloses blending another polymer with a styrene-acrylonitrile copolymer. However, Arakawa et al neither dicloses nor suggests blending an olefin-N-phenylmaleimide copolymer with a styrene-acrylonitrile copolymer.

In addition, the optical film having negative birefringence, and satisfying the relation among the three-dimensional refractive indexes of $nz \geq ny > nx$ or $ny \geq nz > nx$, or $nz > ny \geq nx$ or $nz > nx \geq ny$ according to the invention of the present application is neither described nor suggested at all.

The relation of the three-dimensional birefringence as set forth in column 5, lines 40 to 60 of Arakawa et al relates to **positive birefringence**, which is not describing a uniaxially stretched film comprising a styrene-acrylonitrile copolymer.

The Examiner is reminded that even if there was a prima facie case (which there is not as stated above), unexpected results can be used to rebut such prima facie case. Accordingly, optical films of the present invention having the claimed combination of components a) and b) in the claimed amounts do not exhibit fine cracks and can therefore be used as retardation films. See Examples 1-5 at pages 20 -25 of the specification.

In contrast, Comparative Examples 1-3 use **only component a)** (N-phenylmaleimide-isobutene copolymer and N-(2-methylphenyl)maleimide-isobutene copolymer, respectively in Comparative Examples 1 and 2) **or only component b)** (acrylonitrile-styrene copolymer in Comparative Example 3). **The resulting film have cracks and are brittle or have inferior heat resistance.** See pages 25-28 of the specification. Thus, any prima facie case has been rebutted.

Further, Applicants disagree with the Examiner's representation of what is disclosed in paragraphs [004 and 005] of the specification. Contrary to the Examiner's statements, these paragraphs relate to **background art** and describe the **drawbacks** of using PMMA and PS which have **insufficient heat resistance and are brittle** or of APO which exhibits positive birefiringence. **There is no disclosure or suggestion of the combination of components a) and b) as claimed in the claimed amounts to produce an optical film having negative birefringence or the claimed relation among the three-dimensional refractive indexes.**

Thus, the double patenting rejection of Claims 3-6 and 10-15 over claims 1-4 of US 7,001,967, in view of paragraphs [004 and 005] of the specification, and in further view of Arakawa et al should be withdrawn.

The rejection of Claims 3-6 and 10-15 under 35 U.S.C. § 103(a) over JP 05-117334 and Arakawa et al is traversed.

JP 05-117334 and Arakawa et al fail to disclose or suggest an optical film exhibiting negative birefringence as claimed comprising components a) and b) in the claimed amounts and the claimed relation among the three-dimensional refractive indexes.

In addition, JP 05-117334 and Arakawa et al fail to disclose or suggest the superior properties obtained with the claimed film.

JP-117334 discloses an **olefin/ N-phenyl substituted maleimide/ N-alkyl substituted maleimide copolymer** and an optical material comprising the copolymer. The optical material exhibits **low** birefringence (JP-117334, abstract). However, **low** birefringence is **different from negative** birefringence. Such optical materials cannot be used as optical films which positively make use of birefringence represented by a retardation film because of their characteristic low birefringence.

However, the low birefringence and the negative birefringence are completely different optical characteristics. JP-117334 describes blending or copolymerizing a material having a positive birefringence and a material having a negative birefringence **to cancel the birefringences** thereby obtaining a material of a low birefringence, so that it cannot be utilized as an optical film positively utilizing the birefringence, as represented by the phase difference film and it is contradictory to the invention of the present application which positively utilizes the birefringence (particularly negative birefringence).

Also JP-117334 neither discloses nor suggests not only blending with AS but also the specific characteristics that the relationship among three-dimensional refractive indexes satisfies nz ≧ ny > nx or ny ≧ nz > nx, or nz > ny ≧ nx or nz > nx ≧ ny.

Also JP-117334 describes, in Examples 1 and 2, resins having a negative optoelectric coefficient, but these resins are different from the component (a) constituting the invention of the present application. (In addition, an N-(2-methylphenyl)maleimide-isobutene copolymer described in Example 2 is a resin, that was described, in Comparative Example 2 in the specification of the invention of the present application, to generate fine cracks when employed singly.) Also a resin, corresponding to the component (a) of the construction of the invention of the present application, is described in Example 5 as having a positive optoelastic coefficient.

Still further, JP 05-117334 does not disclose or suggest that the three-dimensional refractive indexes satisfy the relation of nz≥ny>nx or ny≥nz>nx, or nz>ny≥nx or nz>nx≥ny.

Arakawa et al disclose only the use of styrene/acrylonitrile copolymer and fail to disclose the use of component a). Arakawa et al disclose that a uniaxially stretched film of a styrene-acrylonitrile copolymer exhibits negative birefringence. It also discloses blending another polymer with a styrene-acrylonitrile copolymer. However, Arakawa et al neither dicloses nor suggests blending an olefin-N-phenylmaleimide copolymer with a styrene-acrylonitrile copolymer.

In addition, the optical film having negative birefringence, and satisfying the relation among the three-dimensional refractive indexes of nz≥ny>nx or ny≥nz>nx, or nz>ny≥nx or

$nz>nx\geq ny$ according to the invention of the present application is neither described nor suggested at all in Arakawa et al.

The relation of the three-dimensional birefringence as set forth in column 5, lines 40 to 60 of Arakawa et al relates to **positive birefringence**, which is not describing a uniaxially stretched film comprising a styrene-acrylonitrile copolymer.

Arakawa et al merely disclose a film which has a negative birefringence but is inferior in the thermal resistance, as described in Comparative Example 3 of the specification of the present application which has **only component b)** (acrylonitrile-styrene copolymer in Comparative Example 3). **The resulting films have cracks and are brittle or have inferior heat resistance.**

JP 05-117334 and Arakawa et al fail to disclose or suggest an optical film exhibiting negative birefringence as claimed comprising components a) and b) in the claimed amounts and the claimed relation among the three-dimensional refractive indexes.

The optical film of the invention of the present application, does not have cracks, is not brittle and exhibits excellent heat resistance. For example the specification discloses at page 18, lines 19-24:

> "The resin composition for optical film according to the present invention is a resin composition having excellent heat resistance and dynamic characteristics and having excellent characteristics as a composition for optical films exhibiting negative birefringence, and an optical film comprising the same is excellent in heat resistance and dynamic characteristics and can be suitably used for optical films required to have negative birefringence."

The claimed films having the combination of components a) and b) in the claimed amounts do not exhibit fine cracks and can therefore be used as retardation films. See Examples 1-5 at pages 20 -25 of the specification.

In contrast, Comparative Examples 1-3 use **only component a)** (N-phenylmaleimide-isobutene copolymer and N-(2-methylphenyl)maleimide-isobutene copolymer, respectively in Comparative Examples 1 and 2) **or only component b)** (acrylonitrile-styrene copolymer in Comparative Example 3). **The resulting film have cracks and are brittle or have inferior heat resistance.** See pages 25-28 of the specification. These superior properties are not disclosed or suggested by JP 05-117334 and Arakawa et al, alone or in **combination**. Thus, even a **combination** of JP 05-117334 and Arakawa et al does **not** render the present invention obvious.

In summary, the present application relates to an optical film, comprising (a) 30-95% by weight of an olefin-N-phenylmaleimide copolymer, and (b) 70-5% by weight of an acrylonitrile-styrene based copolymer, which exhibits, when stretched uniaxially, a negative birefringence and has the relationship of three-dimensional refractive indexes of $nz \geqq ny > nx$ or $ny \geqq nz > nx$ (claims 3, 4, 15 and 16), or when stretched biaxially, $nz > ny \geqq nx$ or $nz > nx \geqq ny$ (claims 17 to 19), and which is suitable particularly as a phase difference film.

On the other hand, Arakawa et al describes that a uniaxially stretched film of an acrylonitrile/styrene copolymer exhibits a negative birefringence, and also describes blending another polymer with the acrylonitrile/styrene copolymer; but neither discloses nor suggests blending an olefin-N-phenylmaleimide copolymer with an acrylonitrile/styrene copolymer.

Further, Arakawa et al neither discloses nor suggests an optical film having a negative birefringence and having specific characteristics that the relationship among three-

dimensional refractive indexes is nz ≧ ny > nx or ny ≧ nz > nx, or nz > ny ≧ nx or nz > nx ≧ ny.

JP 05-117334 includes descriptions on an olefin-N-phenyl-substituted maleimide copolymer, an olefin-N-phenyl-substituted maleimide-N-alkyl-substituted maleimide copolymer and optical materials based on these copolymers, and such optical materials express an optical characteristic of low birefringence, but cannot be utilized as an optical film positively utilizing the birefringence, as represented by the phase difference film.

Also it neither discloses nor suggests not only blending with the acrylonitrile-styrene based copolymer but also the specific characteristics that the relationship among three-dimensional refractive indexes is nz ≧ ny > nx or ny ≧ nz > nx, or nz > ny ≧ nx or nz > x ≧ ny.

Therefore, rejection of Claims 3-6 and 10-15 under 35 U.S.C. § 103(a) over JP 05-117334 and Arakawa et al are believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.

Applicants respectfully request that the Examiner acknowledge that all references cited in the **Information Disclosure Statement, filed in the above-identified application on March 18, 2004,** have been considered. Notably, the Examiner has not initialed references AW and AX. He states that the translations have not been submitted. **However, the IDS was filed with a Statement of Relevancy stating that the references are discussed at pages 1 and 2 of the specification. Thus, the references should be considered.**

Applicants submit that the present application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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